

## **Biology and Preimaginal stages of *Oides decempunctatus* (Billberg) from Korea (Coleoptera, Chrysomelidae, Galerucinae)**

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**Abstract** Detailed morphological description and illustrations to all immature stages of *Oides decempunctatus* (Billberg) are presented herein for the first time. Some remarks on their systematics and biology are also given.

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**Key words** Coleoptera, Chrysomelidae, Galerucinae, *Oides*, morphology, immature stages, Korea

### **INTRODUCTION**

Classification of adults to the subfamily Galerucinae in the Northeast Asia has been stabilized by Gressitt and Kimoto (1963). But only a few works dealt with immature stages of these beetles : some larvae of Japanese Galerucinae were described by Takizawa (1972) and some larvae of the genera *Pyrrhalta*, *Galeruca* and *Galerucella* were also illustrated and described by Lee (1990a, b).

The genus *Oides* is comprised in the Northeast Asia and 12 species are known from China (Gressitt and Kimoto, 1963). The larval and pupal stages *O. bowringii*, from Japan were briefly illustrated and described by Kimoto and Takizawa (1994). Two species of the genus *Oides* are distributed in Korea : *O. bowringii* (Baly) and *O. decempunctatus* (Billberg). Detailed descriptions of all immature stages of *Oides decempunctatus* (Billberg) and biology, and keys to the larvae and pupae to Korean species of the genus *Oides* are given in this paper for the first time.

### **MATERIALS AND METHODS**

Immature stages of *Oides decempunctatus* were reared on *Ampelopsis brevipedunculata* var. *heterophylla* (Thunb) Hara, *Vitis flexuosa* Thunb in the laboratory. Material examined used in this study were preserved in 70% ethyl alcohol. Larvae and pupae were macerated in 10% KOH solution for 30 minutes, rinsed in water, and dissected under a stereoscopic microscope (Olympus). For morphological

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studies of the minute structure, the parts were mounted on slides and observed through the compound microscope (Olympus). The terminology of chaetotaxy used in this study follows Anderson (1947), Burke (1968) and those for tubercles from Kimoto (1962).

## DESCRIPTIONS OF PREIMAGINAL STAGES

### Subfamily Galerucinae

#### Genus *Oides* Weber, 1801

#### *Oides decempunctatus* (Billberg)

*Adorius decempunctata* Billberg, 1808, In Schonherr, Syn. Ins., 2, 1, p. 203, nota 6b (China).

*Oides decempunctata* Laboissiere, 1927, Ann. Soc. Ent. France, 96, p. 39 (Tonkin).

*Solanophilla gigantes* Roubal, 1929, Bull. Soc. Ent. Ital., 61, p. 96 (Korea; described in Coccinellidae)

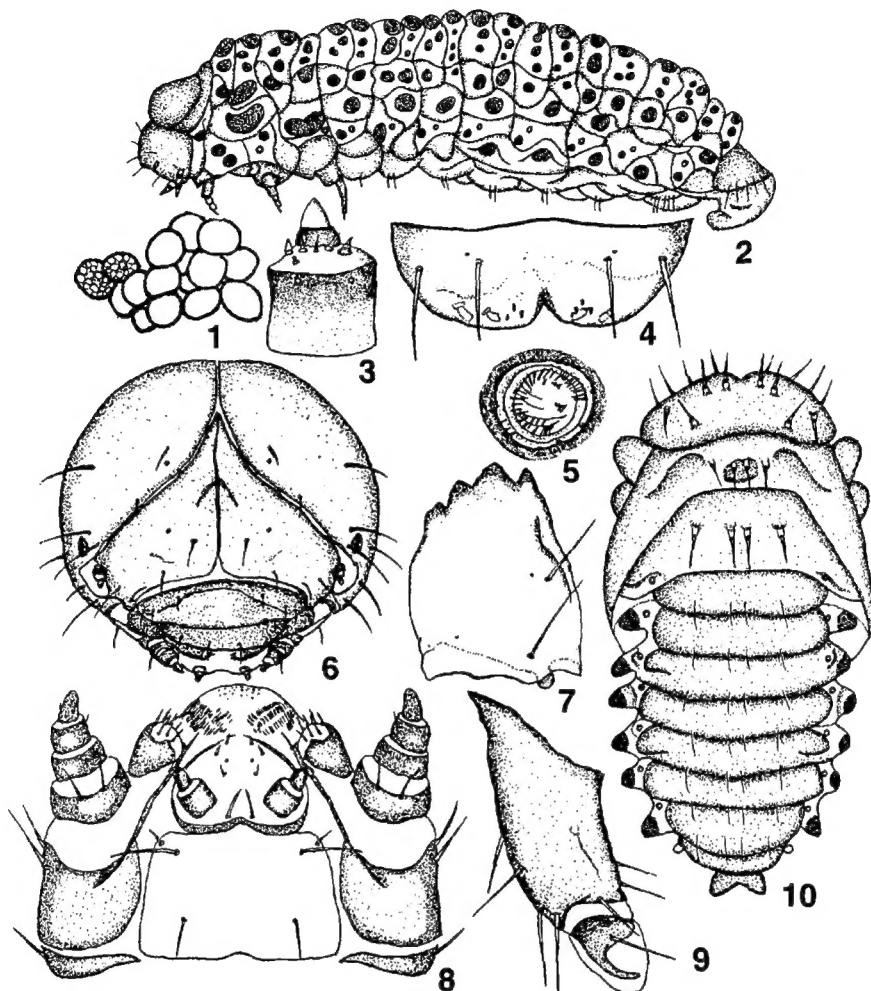
**Egg** (Fig. 1). Length 1.3–1.5 mm, width 0.8–1.0 mm ( $n = 30$ ). Brown, ovoid, surface with pattern of raised polygonal ridges and with mainly penta–hexagonal microsculpture.

**Larva** (Figs 2–9). Length of body 14.0–14.5 mm, width of head capsule 1.6–1.8 mm ( $n = 10$ ). Long and thickened, pale yellow on dorsal side, whitish on ventral side; subcylindrical and subparallel-sided; head and legs brown, inner sides dark brown; tubercles brown, conically elevated and sparse; setae yellowish brown.

**Head.** (Fig. 6). Hypognathous, slightly sclerotized, labrum with lateral margins evenly rounded, usually yellowish. Epicranial suture distinct Y-shaped; coronal suture 1/5 width of head; frons with 3 pairs of frontal setae; endocarina distinct for full length; epistomal suture well developed; stemmata 1 in number on each side. Antenna (Fig. 3) 1-segmented, with conical sensory papilla, 6 spine-like setae and 2 sensilla. Clypeus completely fused with labrum, with 3 pairs of clypeal setae. Labrum (Fig. 4) strongly incised in the middle of anterior margin, W-shaped, with 2 pairs of labral setae and 1 pair of labral sensilla. Epipharynx with 5 pairs of epipharyngeal setae (3 pairs of them minute). Mandible (Fig. 7) palmate, robust, with 4 distal teeth, with 2 mandibular setae and 2 sensilla, black anteriorly, brown posteriorly, penicillus absent. Maxillary palp (Fig. 8) 4-segmented, segment 1 with 2 setae, segment 2 with 1 sensillum, segment 3 with 2 setae, segment 4 with 3 setae. Stipes with 2 setae; cardo with 1 seta. Mala (= fused galea and lacinia) with 7 spiniform setae. Labial palpus (Fig. 8) 2-segmented with 1 seta. Prementum and postmentum separated by sclerotized membrane; prementum with 4 pairs of setae and 1 pair of sensilla, postmentum with 3 pairs setae.

**Thorax.** Pronotum (D-DL type) strongly sclerotized, with numerous short pronotal setae, yellowish. Meso- and metanotum not sclerotized, with minate setae, pale yellow. Legs (Fig. 9) brown, strongly sclerotized, except ventrally, 4-segmented. Femur with 8 setae; tibia with 8 setae; claw falciform, enlarged basally with 1 seta, brown; pulvillus bladder-like, as long as claw, whitish.

**Abdomen.** Typical abdominal segments with two folds. Abdominal spiracles (Fig. 5) present on segments 1–8 similar to mesothoracic spiracles but smaller. Anal plate with 5 pairs of setae. Pygopod



**Figs 1-10.** Immature stages of *Oides decempunctatus* (Billberg). 1. eggs; 2. mature larva (lateral view); 3. antenna; 4. labrum; 5. spiracle; 6. head; 7. mandible; 8. lower mouth parts; 9. leg; 10. pupa (dorsal view).

well developed.

*Pupa* (Fig. 10). Body orange yellow, length 7.8–8.0, width 4.5–4.8 mm ( $n = 10$ ).

*Head*. Rounded, frons with 3 pairs of frontal setae. Frontal setae strongly attenuate, usually slightly curved. Antero-median pronotal setae with conical tubercle on summit. Antero-median tubercles widely separated at base with 4 pairs of antero-lateral setae.

*Thorax*. Mesonotum with 2 pairs of slender, bristle-like mesonotal setae. Metanotum with 2 pairs of fine metanotal setae, more widely separated than mesonotal ones.

*Abdomen*. With two pairs of discotergal setae on each of first seven terga. Seventh abdominal segment slightly larger than previous ones; 9th abdominal segment small, without seta at the base of cerci; cerci

with outer margin round, yellowish. Spiracles on abdominal segment 1–7 conspicuous and black.

Pupal case. Ovoid, length 10–12 mm, width 7.3–8.5 mm (n = 10). Dark brown.

*Material examined.* 10 exs., Ssangyong, Yongwol-gun, [GW], 15 VI 1999 (J.Y. Park). 6 exs., Mt. Geumo, Geumi city, [GB], 12–VII–1999 (J.H. Shim). 5 exs., Andong Univ. campus, Andong city, [GB], 12–VIII–2001 (J.E. Lee). 10 exs., Maemuldo, [GN], 10–IX–1997 (Y.H. Paik).

*Distribution.* Korea, China, Taiwan, Vietnam, Cambodia, Laos.

*Host Plants.* *Ampelopsis brevipedunculata* var. *heterophylla* (Thunb) Hara, *Vitis flexuosa* Thunb.

*Remarks.* The larva and pupa of this species are closely similar to *Oides bowringii*, but is distinguished by the following characters: endocarina distinct for full length, hind corners of epicranium rounded in larva; meso- and metanotum with 4 setae, abdominal segment I–VII with 4 setae respectively, 8th abdominal segment without seta, 9th abdominal segment with well developed cerci in pupa. All the known species of genus *Oides* are also characterized by having a strongly sclerotized small tubercle at the anteroinferior parts of DLpi of abdominal segments I–VIII.

*Biology.* This species has a single generation per year, overwinters in the egg stage, and hatches in early April. The larvae are gregarious on the leaves and take twenty to thirty days to become full grown. The larvae have three instars. The pupation occurs in mid June and takes place in the soil. Just before pupation the larvae fix the case to a soil. The pupal stage takes 15–20 days. The emergence of adults starts in early July and lasts until mid October. The adults are very slow active on host plants, especially during hot sunny days. When approached, they fall to ground and secrete yellowish defensive material. During the mating, the male sometimes vigorously shakes his body. The oviposition period starts in early August. The eggs are laid in egg-mass in the soil or surface.

A key to Larvae of known Korean species of the genus *Oides*

1. Hind corners of epicranium somewhat emarginated; endocarina indistinct anteriorly ..... *Oides bowringii*  
 – Hind corners of epicranium rounded; endocarina distinct for full length ..... *Oides decempunctatus*

A key to pupae of known Korean species of the genus *Oides*

1. Abdominal segment 9 with cerci small and slender ..... *Oides bowringii*  
 – Abdominal segment 9 with cerci big and stout ..... *Oides decempunctatus*

## ACKNOWLEDGMENTS

We thank Mr. Youhyun Paik (Institute of the Korean Specimens) for the assistance to collect the specimens.

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(Received: May 12, 2001)

(Accepted: June 4, 2001)